CLAIMS

WHAT IS CLAIMED:

1. A Faraday system, comprising:

a body having an entrance surface exposable to an ion beam and a depth;

a plurality of openings formed in said entrance surface and extending along said depth; and

at least one conductive detection region disposed adjacent to said body so that at least a portion of said conductive detection region is aligned with at least one of said openings to receive ions through said at least one opening.

2. The Faraday system of claim 1, wherein said body comprises a conductive material.

3. The Faraday system of claim 1, wherein a length of said entrance surface is selected so as to exceed a diameter of a substrate to be exposed to said ion beam with a maximum deflection angle of said ion beam.

4. The Faraday system of claim 1, wherein a height of said entrance surface is selected so as to exceed a beam extension along the height direction when said ion beam has an energy within a predefined range.

5. The Faraday system of claim 1, wherein an aspect ratio of said openings is approximately three or greater.

6. The Faraday system of claim 5, wherein said aspect ratio is at least five.

7. The Faraday system of claim 1, wherein a cross-sectional area of at least one of said openings varies along said depth.

8. The Faraday system of claim 1, wherein a cross-sectional area of at least one of said openings differs from a cross-sectional area of another one of said openings.

9. The Faraday system of claim 1, wherein said detection region comprises plural conductive detection sub-regions that are electrically insulated from each other, each of said sub-regions disposed adjacent one or more dedicated openings to receive an ion beam portion through said one or more dedicated openings.

10. The Faraday system of claim 9, wherein some of the plural sub-regions have, at least at one location along said depth, a cross-sectional area that is less than a cross-sectional area of at least one other sub-region.

11. The Faraday system of claim 1, further comprising a charge-sensitive measurement device connected to said detection region.

12. The Faraday system of claim 9, further comprising a charge-sensitive measurement device connected to said plural detection sub-regions to provide individual measurement readings for each of said sub-regions.

13. The Faraday system of claim 1, further comprising a Faraday cup designed for beam shape measurement, said Faraday cup being attached to said body.

14. The Faraday system of claim 1, further comprising a drive assembly coupled to said body to move said body at least transversely to said ion beam.

15. A Faraday system, comprising:

a traveling Faraday cup designed to allow ion beam profile measurements; and

a Faraday assembly attached to said traveling Faraday cup, said Faraday assembly including:

a body having an entrance surface and a plurality of openings formed in said entrance surface and extending through said body, and

one or more conductive detection regions associated with one ore more of said openings to receive ion beam portions through said openings.

16. A method of controlling an ion beam, the method comprising:

exposing at least one detection surface to an ion beam through a plurality of longitudinal openings that are substantially devoid of an electric field; and

adjusting at least one of beam parallelism and beam divergence on the basis of a measurement reading from said at least one detection surface.

17. The method of claim 16, wherein adjusting at least one of beam parallelism and beam divergence further comprises varying at least one tool parameter and selecting a parameter value as a desired value when a maximum beam current is detected.

18. A method of monitoring an ion beam, the method comprising:

scanning a Faraday system across an ion beam for a plurality of scan positions; and

determining a beam intensity of at least some sub-portions of a beam portion impinging on said Faraday system at each scan position.

19. The method of claim 18, further comprising comparing the beam intensity of at least two sub-portions of the impinging ion beam portion, and estimating at least one of a beam parallelism and a beam divergence on the basis of a result of said comparison.